

# A Model for a “Saint Leadership” and Its Significance to Engineering Education

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## **Abstract**

*In the 21st century, the growth of disruptive technology is accelerating. Additionally, there is a growing need for the best engineering graduates across all developing nations. Institutional leaders are compelled to implement industry-relevant, interdisciplinary research and development programs, continually build their faculty, and offer consultancy services to transnational companies. Hence, these engineering institutes must be headed by saint leaders who must create a vision and mission, develop the faculty members, prepare interdisciplinary and outcome-oriented curricula, prepare needed learning resources, develop learners, plan the institutions, offer consultancy services under various global and national projects, manage the finance required, follow up after the faculty retirement, and possess needed managerial characters. Further, they recognize the need to allocate time for work-life balance and to reward faculty for their best performance in generating internal revenue. They never indulge in toxic activities that destroy the academic environment and culture. The saint leaders are unique in creating a vision, delegating the necessary authority, following ethical principles, promoting equity and integrity, and mentoring all faculty members. This model has undergone quality validation through three projects.*

**Keywords:** *Saint leadership, Faculty development, Interdisciplinary curriculum, Learning resources, Institutional planning, Consultancy services, Financial management, Follow-up after retirement*

## **1. Introduction**

In this competitive 21st century, all higher education institutes need appropriate leadership that can create an academic environment to develop outstanding outcome-based and industry-relevant graduate and postgraduate programs, multidisciplinary doctoral programs, and motivate all the faculty to immerse themselves in planning bid documents to undertake research and development projects under transnational companies and international development agencies. The institute's vision should guide all faculty members in developing diverse, outstanding global faculty development programs, creating intellectual property, and earning royalties through licensing to industries that sign contracts to use these intellectual properties. The faculty must continuously update their cognitive abilities, management skills, analytical expertise, and product innovations, and suggest quality production processes. The

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leader must delegate project-specific authority, prepare cost-effective bids using appropriate technical proposals, and negotiate with client managers. The leader should uphold ethical standards and ensure equity to maintain integrity in all decisions. All these are required to develop strategic plans and sustain the industrial links. Furthermore, he must support faculty members whenever they need assistance in overcoming bottlenecks and resistance. Without these abilities, the institutes' growth will be retarded.

Over the last twenty-five years, the growth of toxic leaders in engineering institutes has undermined many outstanding faculty teams, eroded human and knowledge capital, and hindered the delivery of services to companies, engineering departments, and the broader community. There is a need for saintly leadership to halt the growth of toxic leaders and foster the development of outstanding faculty members.

## **2. Literature survey**

Kezar and Holcombe [1] have stated that today's higher education leadership challenges necessitate new forms of leadership. According to them, a volatile financial environment, the rise of international partnerships, greater accountability pressures, and the need for new business models, technologies, and adapting to changing demographics are just some of the challenges that call for leadership solutions tested both inside and outside of higher education. According to Meg Handley et al. [7], the concept of engineering leadership has grown significantly over the past decade. Definitions of engineering leadership have not converged to a consensus, but common attributes, skills, and competencies have emerged across disciplines. According to Ghamrawi et al., [9], the focus should be on shared models, such as distributed leadership and dispersed leadership.

Furthermore, the development of individual students, communities, and society has emerged as a key area of focus. According to John Donald and Marnie Jamnison [5], engineering leadership should bridge the culture gap in engineering education, removing a significant barrier to systemic change toward enhanced non-technical skill development in the existing culture. According to Malle Schilling et al. [6], the intentional preparation of leaders who are ready to create inclusive environments for graduate and, in some cases, undergraduate engineering students has not kept pace with the need. With the rapid and continued growth of the field, there is a growing need to place greater emphasis on research and practice related to leadership in engineering education [3][8]. Furthermore, they urged current leaders to invest in the future of engineering education by increasing their focus on leadership at all stages of graduate education and early career faculty development, as this investment is crucial to advancing the field in both research and practice. According to Adrianna Kezar [2], it is more effective to introduce oneself to this scholarship by exploring various schools of thought rather than focusing on a single theory or concept. According to Gumus, Bellibas, Esen, and Gumus [4], related research on leadership models has to focus on the effects of leaders on organizational behaviors and student achievement. According to Salihu, M.J., personal leadership frameworks enable educators to monitor their progress and focus on achieving their leadership targets and vision.

Synthesis: All researchers seek an effective leadership model to produce the most competent graduates. This demands a focused vision, a planned mission, faculty development, interdisciplinary curriculum planning and implementation, providing needed learning resources, developing learners who can carry needed attributes, institutional planning and development, offering consultancy programs to various clients, implementing through financial management, developing faculty from recruitment to retirement, and adopting

appropriate management practices. All these characteristics can be summed up as saint leadership. The subcomponents are identified by observing past leadership failures. To create excellent graduates, researchers, and outstanding faculty members, it is essential to have saintly leadership. The proposed model will be of great use in all higher education institutions.

### **3. Statement of the problem**

Considering the challenges in developing outstanding engineering graduates, interdisciplinary postgraduates, and multidisciplinary doctoral candidates, and encouraging faculty to generate internal revenue by utilizing their resources, space, and higher-order capabilities, develop a model for Saint Leadership. Such a leadership would facilitate the rapid growth of human and knowledge capital, and contribute to the economy.”

#### **3.1. Research objectives**

- Evaluate existing models of leadership to promote excellence in various engineering programs.
- Use faculty members' feedback to identify shortcomings in leaders in developing outstanding engineering programs.
- Identify the skills of saint leaders needed to achieve outstanding outcomes through institutional development.

#### **3.2. Research methodology**

A qualitative approach is based on the significant findings from a set of high-performing senior and middle-level faculty members working in state technical universities and autonomous institutions.

Population: Qualified senior faculty members from state universities and autonomous engineering colleges are planning many innovative programs and developing outstanding industry-ready graduates.

Sample: 429 faculty members (321 male and 108 female) participated in this research. All of them have completed 20 years of teaching at their institutions and hold master's degrees in engineering.

Development Process: Review case studies of failures due to poor leadership across selected autonomous institutions in challenging research areas and complex global projects, and identify the root causes of these failures. Obtain suggestions from faculty members' Quality Circles on the most desirable qualities in leadership and utilize these suggestions to develop a model for Saint Leadership in Engineering Education. This is a bottom-up methodology.

#### **3.4. Desired planning and performance of saint leaders**

Saint leaders focus on the excellence of the institutions, curricula, instructional package development, delivery, and developing needed attributes in learners, scaffolding the faculty in planning and executing complex consultancy projects, creating outstanding human capital and knowledge capital, providing needed services to the community and Medium, Small and Micro Enterprises (MSMEs), International Development Agencies (IDAs), and get a reputation for the programs, faculty members, and graduates. They focus on ethics, equity,

integrity, and empathy. They never engage in micromanagement and strongly oppose toxic leaders.

A model for saint leadership consists of twelve components, and they are presented below:

#### (1) Vision and Mission

Vision and mission have been identified by conducting a Strength, Weakness, Opportunity, and Threat (SWOT) analysis. The following steps are essential to determine the vision based on the context of growth and impact of disruptive technologies:

- Develop an exceptional vision that accounts for the necessary transformation and engages all relevant stakeholders.
- Develop a mission to achieve the vision flawlessly
- Create resources and employ the most promising, motivated, and outstanding faculty teams
- Continuously monitors the achievement of the institute and implements remedial measures
- Prepare to address the VUCA (vulnerability, uncertainty, complexity, and ambiguity) challenges in developing engineering programs, offering consultancy services, and creating necessary instructions.

#### (2) Faculty Development

Faculty members are primarily responsible for the transformation process and must be developed continuously and appreciated for their outstanding performance. The following 13 steps are essential to create and harness the excellence of the faculty members:

- Develop Outstanding Faculty Teams in Every Branch of Engineering through needed training from recruitment to retirement
- Establish a Diverse Global Faculty Development Center to Offer Non-formal, Formal, Flexible, and Outstanding Outcome-Oriented Programs
- Assist New Recruits and Junior Faculty Teams in Excel
- Sponsor the faculty members to present research papers at international conferences
- Suggest strategic career planning for the uninterrupted professional growth of engineering faculty members through supporting research work, continuous assessment, and offering adequate training
- Develop an algorithm for creating innovative faculty teams
- Inspire a culture of appreciation for high-performing faculty development, research scholars, and graduates.
- Protect high-performing faculty members from a toxic environment and develop strategies to facilitate radical growth.
- Develop the art and science of creating and retaining high-performing faculty teams.
- Facilitate outstanding engineering faculty members from scaffolding whenever they need to accomplish innovations in research and development
- Resolve faculty equity issues and challenges through analysis of problems and obstacles
- Plan in-house leadership development programs for high-potential and high-performing engineering faculty teams
- Support self-regulated learning strategies for engineering faculty members

### (3) Interdisciplinary Curriculum Development

In the 21st century, interdisciplinary skills are essential for analyzing, planning, designing, developing prototypes, testing, improving, and selecting effective and efficient methods for the mass production of equipment, machines, tools, and maintenance. The following five steps are essential to prepare an interdisciplinary curriculum:

- Conduct an in-depth learning needs analysis and synthesize the multidisciplinary cognitive skills, high-performing motor skills, and need attitudes.
- Develop a set of outstanding interdisciplinary curriculum planners to inculcate desired attributes in the graduates
- Facilitate the development of interdisciplinary engineering, technology, and applied science curricula to meet the challenges of fast-growing disruptive technologies
- Develop strategies for curriculum design and implementation for industry-specific dual programs
- Develop an algorithm for planning and updating outcome-based engineering, technology, and applied science curricula to meet the needs of a cluster of transnational companies

### (4) Learning Resources Development

For every course, learners need well-developed learning resources, including textbooks, item banks, learning aids such as video programs, multimedia learning packages, laboratory manuals, workshop manuals, design and drawing manuals, and case studies. The following five steps are identified to plan and develop learning resources:

- Establish an instructional materials development center.
- Assist faculty members in developing innovative instructional materials to enhance graduates' advanced cognitive abilities.
- Introduce and validate educational video programs, multimedia learning packages, case studies, and assignments based on industry-specific programs.
- Approve credits earned through Massive Open Online Courses (MOOCs)
- Design on-the-job training in selected companies and offer credits

### (5) Developing Learners

Learners are to be counselled, coached, and mentored by dedicated faculty members. This process involves a thorough exposure to real-world problems through well-planned on-the-job training.

- Plan and mentor the learners through on-the-job training programs, cooperative, part-time courses, dual programs, capstone projects, and MSME-sponsored dissertations.
- Develop an Instructional System Technology, offer a well-planned participative class, and design appropriate quizzes, assignments, laboratory, and field work.
- Encourage the graduate students through needed counselling, coaching, and optimum mentoring
- Encourage learners to participate in professional quiz programs
- Guides the learners to win awards in national design competitions and research paper presentations
- Recommend that learners apply for international programs to acquire advanced cognitive abilities, critical thinking skills, and product development
- Introduce the best practices in planning and implementing engineering mathematics and science courses for engineering students

#### (6) Institutional Planning and Development

This involves creating the necessary resources, infrastructure, funding, and employer linkages.

- Establish an engineering college/university with the necessary infrastructure, library resources, sports fields, hostels, medical facilities, recreational facilities, and transport facilities.
- Approve the planning of stable buildings based on institutional needs without compromising the quality and strength of the foundation
- Eradicate the networked and fast growth of toxic leaders in autonomous institutions
- Develop dynamism and total integration in engineering programs planning to meet the transnational industry needs based on theory to practice
- Plan radical development of engineering institutions in the industrial corridors to serve the complex needs of the fast-growing transnational companies
- Eradicate toxic leadership that transforms into white-collar crimes in autonomous higher education institutes
- Develop a winning culture in engineering institutions
- Establish a multidisciplinary human resources development institute under a public-private partnership
- Create a happy educational environment in engineering institutions to sustain outstanding performance by well-accomplished faculty teams
- Establish equity, integrity, ethics, humility, and an outstanding culture to sustain the innovations in engineering colleges
- Conduct performance audits and improve engineering institutes for the sustainability of human capital development
- Develop alliances with international universities, national labs, and research units of companies for building cooperation for innovation in engineering education

#### (7) Consultancy Services under Global Projects

Any educational program must ultimately provide services to the community, industry, and other public organizations.

- Create teams of world-class consultants to undertake sponsored research and development projects.
- Counsel, coach, and mentor the junior faculty members to work on global projects as associates under international agencies' development projects
- Provide desired leadership to facilitate the preparation of quality-based technical and cost-effective financial proposals for undertaking complex global projects under an International Development Agency and a Transnational Company.
- Develop an academic ecosystem to plan effective, efficient executive development for transnational corporations through continuing education programs.
- Empower communities through engineering education.
- Plan a continuous improvement in the project-based learning method to meet ever-growing industrial needs due to disruptive technologies

#### (8) Financial Management

Even though federal and state governments provide grants-in-aid to a considerable extent, there is a need to generate additional funds through internal revenue sources.

- Facilitate internal revenue generation and utilization through intellectual products.

- Develop financial management and revenue generation to sustain institutional development.

(9) Follow up with outstanding faculty members after retirement

Utilizing the outstanding faculty teams' skills, competencies, and mentoring skills through part-time service as emeritus professors is essential.

- Pay the due amount immediately on the date of retirement
- Utilize the expertise by offering an emeritus professor post
- Offer an adjunct professor post
- Share the royalty accrued
- Utilize the expertise for consultancy projects

(10) Managerial Characters

Higher education administration and management processes are required to overcome the weaknesses in the system and manage threats due to competing institutions:

- Focus on developing continuous improvements in all academic activities
- Consult professional leaders, alums, faculty members, support staff, and society at large
- Continuously reward the faculty, support staff, and learners for their best performance
- Focus on global leadership in research, education, and services
- Establish an Academic Council to assist in the planning of various programs
- Create Boards of Studies to plan and develop various programs
- Establish a Grievance and Redressal Council to resolve grievances of students, faculty members, and technical support personnel.
- Implement distributed leadership by creating deans' posts for curriculum development, preparing instructional materials, undertaking consultancy projects, planning diverse global faculty development programs, planning multidisciplinary research and development programs, organizing international conferences, and collaborating with leading global universities.

(11) Opportunities to allocate time for Work-Life Balance

Saint leaders offer significant opportunities for planning work-life balance programs.

- They offer vacations in accordance with the norms to participate in the planned activities organized by the faculty members.

(12) Reward Management

Saint leaders always plan and implement appropriate reward management.

- They recognize outstanding consultancy projects that brought significant internal revenue.
- They share the project gains after meeting the expenditure with the faculty and support staff.
- They recognize the awards received by faculty members for their best papers, textbooks, learning aids, and intellectual property.
- Never stop the professional growth of the outstanding faculty members through any form of discrimination.

### **3.5. Faculty development programs**

In India, from 1991 to 2007, approximately 12 short-term courses were organised annually in the following areas for faculty members under the Ministry of Education's Quality Improvement Programs or World Bank-assisted Tech I-III projects. The courses lasted five working days. The participants were offered case studies and planning assignments.

1. Outcome-based curriculum development in engineering and technology
2. Planning interdisciplinary postgraduate programs
3. Planning industry-sponsored graduate and postgraduate programs
4. Curriculum evaluation (Formative and Summative) and improvement
5. Planning non-formal courses
6. Planning distance education programs
7. Planning consultancy programs
8. Training the employees of local companies
9. Planning and developing textbooks, design and drawing manuals, laboratory manuals, case studies, and item banks
10. Leadership development
11. Planning on-the-job training courses
12. Leadership development
13. Student services
14. Institutional development
15. Internal revenue generation
16. Human resources development
17. Continuing education programs
18. Planning executive development courses
19. Developing video programs
20. Developing multimedia learning packages
21. Learning organization
22. Interpersonal relationships
23. Planning and conducting tracer studies
24. Planning and conducting project impact studies
25. Organizational change and development
26. Higher education administration
27. Planning consultancy projects
28. Developing diverse global faculty development programs
29. Establishing in-house faculty development programs
30. Developing counselling, coaching, and mentoring courses

In addition to the above courses, many faculty members undertook advanced courses and postgraduate and doctoral programs to meet their professional needs.

### **3.6. Validation of the model**

In each faculty development course, the faculty members were assigned case studies on saint leadership to evaluate and plan for implementation. The World Bank-assisted projects (Tech Ed I to III) were fully utilized to provide real-life opportunities to participate in Planning, Programming, and Budgeting (PPBS) Sessions. This is a challenging research cum training project. All 120 principals were actively prepared for capacity development, quality improvement, and efficiency improvement components under the World Bank's assistance. According to the World Bank's independent assessors, the projects were completed by the

contractor. A similar project was implemented for Bhutan's technical educators under the United Nations Development Project (UNDP). A third project, under the Asian Development Bank-assisted Council for Technical Education and Vocational Training in Kathmandu, Nepal, was completed. Under the Project Completion Report, the model has been highlighted. Under the World Bank-assisted Project III for the Union Territory of Andaman and Nicobar Islands, training courses were offered to the faculty of project polytechnics. The World Bank's independent evaluator appreciated the outcome.

#### **4. Discussion**

The ten “Saint Leadership” components are to be followed systematically. There is a need for expert trainers who can counsel, coach, and mentor the principals. Furthermore, the project director needs to delegate authority to plan the various components of institutional development. Every six months, the principals presented the development of the detailed project proposal to a set of experts through a joint review commission. However, the project faced numerous obstacles and bottlenecks. The needed funds were obtained from the World Bank.

#### **5. Conclusions**

Considering the importance of educational leaders in developing higher education institutions, one should seek more balanced leaders with integrity and ethics, and offer equity to all faculty members. Most existing models do not address all sensitive issues. Hence, this search brings a model of Saint Leadership by integrating twelve sensitive issues and creates a model that incorporates: 1) Vision and Mission, 2) Faculty Engagement, 3) Interdisciplinary Curriculum Development, 4) Learning Resources Development, 5) Developing Learners, 6) Institutional Planning and Development, 7) Consultancy Services and Global Projects, 8) Financial Management, 9) Follow up with a Outstanding Faculty Member after Retirement, 10) Managerial Characteristics, 11) Opportunities to Allocate Time for Work-Life Balance, and 12) Reward Management. These twelve issues are to be resolved by the saint leaders.

##### **5.1. Limitations of this model**

This model was linked to faculty development programs under the Quality Improvement Program, state-sponsored faculty development courses in extension centres, and the sponsored Institutional Development Project, funded by the World Bank. Validation was only through the qualitative method. However, feedback was obtained for every faculty development program, and almost all trainees appreciated the methodology, case studies, and mentoring.

##### **5.2. Suggestions for further research**

Although this complex model may take at least two to three years to complete, the authorities need to approve it, and experienced trainers are required. This research project can be replicated in any institution, university, or autonomous institution. Culture, equity, empowerment, ethics, and integrity will play a significant role.

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